

January 7, 1974
Preliminary Copy
University of Idaho

EMIDA SERIES 65 Ida 0505

The Emida series comprises Alfic Fragiorthods, members of a fine silty, mixed, frigid family. Typically, the bisequa profiles consist of O horizons, a very thin discontinuous A2 horizon, a yellowish-brown or brown silt loam Bir, a light-gray silt loam A'2, and pale-brown or light yellowish-brown prismatic silty clay loam B'tx or distinct fragipan.

Typifying Profile: Emida silt loam (cedar, hemlock, grand fir).

(Colors for dry conditions unless otherwise noted).

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|-------|----------|---|
| 011 | 1.2-0.7" | Slightly decomposed needles and twigs; neutral (pH 6.6 bromthymol blue). 0 to 1 inch thick. |
| 012 | 0.7-0" | Partly decomposed needles and twigs; neutral (pH 6.6 btb); abrupt, irregular boundary. 0 to 1.5 inches thick. |
| A2 | trace | Grayish-brown (10YR 5/2) silt loam mixed with 02 material; very dark grayish brown (10YR 3/2) moist; fluffy; discontinuous; slightly acid (pH 6.1 btb); abrupt, broken boundary. 0 to 2 inches thick. |
| B21lr | 0-8" | Yellowish-brown (10YR-7.5YR 5/4) silt loam; dark brown (7.5YR 3/4) moist; slightly redder hue and lower value in upper few inches; appears massive in places but parts to weak, very fine crumb structure; very soft, very friable, slightly sticky, nonplastic; abundant fine and very fine, plentiful medium, and few coarse roots; many micro interstitial pores; some very fine, black concretions or charcoal (silt size); |

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- medium acid (pH 5.7 chlorphenol red); clear, smooth boundary. 4 to 8 inches thick.
- B22ir 8-18" Light yellowish-brown (10YR-7.5YR 6/4) silt loam; dark brown (7.5YR-10YR 4/4) moist; appears massive in places but parts to weak, very fine crumb structure; very soft, very friable, slightly sticky, nonplastic; roots as in B21ir; medium acid (pH 5.7 cpr); abrupt, irregular boundary. 7 to 15 inches thick.
- IIA'2 18-21" Light-gray (10YR 7/2) silt loam, high in coarse silt; brown (10YR 5/3) moist; massive; hard, firm, slightly brittle, slightly sticky, nonplastic; plentiful fine and very fine, few medium roots; many micro fine, and very fine tubular and few vesicular pores; some black concretions; very strongly acid (pH 4.8 brom-cresol green); clear, wavy boundary. 2 to 5 inches thick.
- IIA'&B'x 21-26" Light-gray (10YR 7/2) silt loam, with splotches of brown (7.5YR 4/3) material; brown (10YR 5/3) moist; massive; very hard, firm, slightly sticky, slightly plastic; few fine and very fine roots; many micro, fine and very fine tubular pores; many, small soft, black concretions; no clay films; very strongly acid (pH 4.8 bcg); clear, wavy boundary. 4 to 6 inches thick.
- IIB'21x 26-41" Pale-brown (10YR 6/3) and yellowish-brown (10YR 5/4) silt loam; brown (10YR 5/3) and dark yellowish-brown (10YR 4/4) moist; moderate, coarse and very coarse

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prismatic structure with light-gray (10YR 7/1 dry and 10YR 6/2 moist) streaks of A'2 $\frac{1}{4}$ inch thick between peds; very hard, firm, slightly sticky, slightly plastic; few roots matted on prism faces, none in interior of peds; no clay films; pores and concretions as above; very strongly acid (pH 4.6 bcg); clear, smooth boundary. 12 to 18 inches thick.

IIB'22tx 41-53"+ Light yellowish-brown (10YR 6/4) silty clay loam; dark yellowish-brown (10YR 4/4) moist; moderate, very coarse prismatic structure; massive interiors; extremely hard, very firm, sticky, plastic; no roots; pores and concretions as above; thick, continuous clay films on vertical surfaces and in pores; very strongly acid (pH 4.6 bcg).

Type Location: Benewah County, Idaho; about 100 feet west of road in the SW $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 24, T. 45 N., R. 3 W. Southeast-facing 12 percent slope at 3,120 feet elevation.

Range in Characteristics: The thickness of the sola is over 5 feet. The sola consists of a very thin, discontinuous albic horizon below the O horizons, a spodic horizon, and a lower sequum of an albic horizon over a combined weak-argillic horizon and distinct fragipan. The horizon sequence is commonly O1, A2, Bir, A'2 or IIA'2, A'&B' or B'&A' or IIA'&B', B'tx or IIB'tx, and C or IIC. Some fine rounded gravel is present in the lower sequum. An O2 horizon thinner than 0.5 inch is present in many places. Where undisturbed, a light-gray or light brownish-gray A2 horizon, 0.1 to 0.5 inch thick, is common above the Bir; but it is only faint or is mixed with the O2 horizon. The Bir is very friable, has very fine

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crumb structure, and is continuous. The Bir ranges in thickness from 13 to 23 inches. The upper 2 inches of the Bir contains between 3 and 7 percent organic matter having a C:N ratio of 15 to 20. The B21ir ranges in hue from 10YR to 7.5YR, in chroma from 3 to 4, and in value from 4.8 to 5.8 when dry and from 2.8 to 3.6 when moist. The B21ir is generally lower in chroma and value than the B22ir. A B3ir is present in many places. The A'2 or IIA'2 horizon ranges in color value from 6.4 to 7.2 when dry and is brittle when moist. The B'x or IIB'x horizon has distinct vertical fracture planes filled with A'2 material, which contains less clay than the prisms. Roots are matted on the prism faces. The structure of the B'x is moderate, coarse or very coarse prismatic. Clay films are generally not present on the upper part of the B'x but increase in thickness with depth. Depth to the B'x ranges from 20 to 36 inches. The pH of B2ir ranges from 5.6 to 6.5, the A'2 ranges from 4.8 to 6.0, and the B'x ranges from 4.5 to 6.0. The pH commonly increases with depth in the lower sequum. The mean annual soil temperature ranges from 40° to 47°F.

Competing Series and Their Differentiae: The Helmer series is in the same family as the Emida and differs from the latter in having a Bir thinner than 15 inches. Related series in other subgroups are the Santa and Helmer series. The Santa series does not have a spodic horizon. The Helmer series does not have a fragipan and has a weak B'2t.

Setting: The Emida series occupies undulating to steep loess-covered uplands and alluvial fans. Some areas are probably alluvium from loess. The upper sequum has a considerable content of volcanic ash. The climate is humid and has an average annual precipitation ranging from 35 to 45 inches, including 6 to 12 feet of snowfall, a mean summer air temperature of 60° to 62°F., and an average frost-free period of 50 to 100 days.

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Principal Associated Soils: These include the Huckleberry, Santa, Helmer, and Porrett series. The Santa and Porrett series do not have a spodic horizon. The Huckleberry and Helmer series do not have a fragipan.

Drainage and Permeability: Moderately well drained; medium runoff; permeability of the Bir is moderate but is very slow in the fragipan.

Use and Vegetation: Pasture and timber are the main uses. The natural vegetation consists chiefly of western red cedar, western hemlock, grand fir, pachistima, wild rose, twinflower, and fern.

Distribution and Extent: Northern Idaho. This series is of moderate extent.

Series Proposed: Worley-St. Maries Area, Benewah and Kootenai Counties, Idaho, 1964. (Name from creek).

Remarks: The Emida series was classified formerly in the Brown Podzolic group, intergrading to a Planosol.

LWG 10-8-64

National Cooperative Soil Survey

Rev. LWG-WJL 2-8-65

U. S. A.

Chemical characterization and physical analysis of profile

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Emida

No.	Horizon	Depth in.	pH Paste	pH 1:5	ECx10 ³	Saturation extract me/1000 gms soil							
						Ca	Mg	Na	K	CO ₃	HCO ₃	Cl	SO ₄
1	B21lr	0-8	6.10		.01								
2	B22lr	8-18	6.10		.01								
3	IIA'2	18-21	5.55		.15								
4	IIA'+B'x	21-26	5.25		.10								
5	IIB'2lx	26-41 ⁺	5.15		.05								
6	IIB'22tx	41-53	5.05		.10								

Exchangeable ions me/100 gms					C.E.C. meq/100	Base		CaCO ₃	E.S.P.	O.M. %	N %	C:N	Soil:Rx ratio
Ca	Mg	Na	K	H		Sat.%	Gyp.						
3.0	.6	.1	.4	19.7	20.0	17.4				2.09	.099	12.3	
2.7	.6	.1	.6	16.3	16.3	19.9				1.49	.065	13.4	
2.8	.9	.1	.2	3.9	7.2	51.0				.34	.032	6.3	
2.8	1.2	.1	.2	5.6	7.6	43.6				.26	.027	5.6	
2.9	1.6	.1	.1	7.4	10.8	39.1				.24	.029	4.8	
5.2	3.0	.2	.1	9.3	17.2	47.9				.29	.045	3.8	

$$\% C = \frac{\% OM}{1.72}$$

Profile: 65 Ida 0505 - Emida Series

Date: September 16, 1969

No.	Particle size distribution (mm) (percent)							Gravel &	Texture Class
	VCS	CS	MS	FS	VFS	TS	TSi	TC	
	2-1.0	1-0.5	0.5-0.25	0.25-0.05	0.1-0.05		0.05-0.002	<0.002	
1	.54	.52	.45	1.98	9.64	13.12	80.09	6.75	Silt
2	.18	.31	.36	1.89	8.99	11.72	80.41	7.86	Silt
3	.26	.39	.49	2.40	7.81	11.36	75.32	13.32	Silt Loam
4	.44	.55	.73	2.60	7.21	11.53	77.72	17.91	Silt Loam
5	.31	.34	.37	1.84	5.09	7.95	83.97	8.07	Silt
6	.49	.76	.54	1.21	4.00	7.00	67.66	24.80	Silt Loam

Reference for data:
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